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10/725,231	12/01/2003	Rebekka Epsch	58278US004	2120

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EXAMINER	
HU, HENRY S	

ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 08/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/725,231	EPSCH ET AL.	
	Examiner	Art Unit	
	Henry S. Hu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *RCE of June 13, 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) *8-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-15* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7-18-05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. This Office Action is in response to the **RCE** Amendment filed on June 13, 2005. With the Applicants' RCE amendment, Claim 1 was further amended to incorporate the limitation as "the melt processible fluoropolymer is obtained through aqueous emulsion polymerization", and no claim was added. The Applicants have provided some support of the amendment for parent Claim 1 on page 7 (not on page 6) of Remarks, the Examiner also has found out that **the support for using "aqueous emulsion polymerization" to obtain such an aqueous fluoropolymer dispersion is clearly on page 2 at lines 5-8 and 23-29 as well as on page 6 at lines 9-11 and 17-20**. **Claims 1-15 are now pending,** while Claims 8-15 are non-elected (without traverse) and are still withdrawn from consideration by the examiner. An action follows.

DETAILED ACTION

Response to Argument

2. In view of the Applicants' argument on pages **6-8** of Remarks, the examiner withdraws both of 102 and 103 rejections over Oxenrider reference. After further search, new rejections are applied for this RCE.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. The limitation of amended parent **Claim 1** of present invention relates to ***an aqueous fluoropolymer dispersion comprising: (A) a melt processible fluoropolymer obtained through aqueous emulsion polymerization,*** *the melt processible fluoropolymer is* ***not self-emulsifying*** *and the melt processible fluoropolymer is present in an amount of at least 25% by weight based on the weight of the aqueous fluoropolymer dispersion;* ***and (B) a fluorinated surfactant*** *having a molecular weight of not more than 1000g/mol in an amount of* ***not more than 100ppm*** *based on the weight of fluoropolymer solids* ***or being free of said fluorinated surfactant****, said aqueous fluoropolymer dispersion having* ***a conductivity of at least 200 μS/cm****. See other limitations of dependent* ***Claims 2-7****.*

5. Claims 1-3 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Hintzer et al. (WO 01/79332).

Regarding the limitation of parent **Claim 1**, **Hintzer** et al. disclose a process for removing steam-volatile fluorinated emulsifiers in their free acid form down to **less than 100 ppm**, from aqueous fluoropolymer dispersions obtained from aqueous emulsion polymerization (abstract, line 1-4; page 1, line 6-25). Perfluorooctanoic acid (PFOA or APFO) is used as emulsifier (page 2, line 7-12), while **such a process may be applied to low molecular weight**

and melt-processible fluoropolymers such as fluorinated thermoplastics or fluoroelastomers (page 2, line 11-12).

It is noted that PFOA or APFO is reading on the claimed molecular weight of fluorinated emulsifier being less than 1000 g/mole. With respect to the limitation on "aqueous fluoropolymer dispersion having **a conductivity of at least 200 μS/cm**", Hintzer further discloses that such obtained polymers normally have enough **polar endgroups such as COO^-, SO_3^- and $O\text{-}SO_3^-$** (page 2, line 30-33). The resultant dispersions made by Hintzer would certainly carry the claimed conductivity since such endgroups are related to ionic type.

6. Regarding **Claim 2**, other ionic salt(s) may be used in addition to polar endgroups in the salt form mentioned above (page 5, line 5-14). All these salts would certainly contribute to a higher conductivity.

Regarding **Claim 3**, non-ionic emulsifiers are added before removing fluorinated emulsifier (abstract, line 2).

Regarding **Claim 6**, fluorinated emulsifiers can be removed down to **less than 100 ppm, preferably less than 50 ppm, particularly preferably less than 25 ppm, and in particular less than 5 ppm** (page 1, line 6-10).

Regarding **Claim 7**, acidified aqueous dispersions can directly be distilled to obtain elastomer dispersions with PFOA less than 50 ppm and with solid contents of higher than 50% (page 2, line 33-35).

7. Claims 1-3 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Bladel et al. (WO 00/35971).

Regarding the limitation of parent **Claim 1**, **Bladel** et al. disclose a process for reducing the amount of fluorinated surfactant in aqueous fluoropolymer dispersions down to **less than 100 ppm** by contacting anion exchanger, from aqueous fluoropolymer dispersions obtained from aqueous emulsion polymerization (abstract, line 1-3; see table 1). Perfluorooctanoic acid or its ammonium salt (PFOA or APFOA) is used as emulsifier, while **such a process may be applied to low molecular weight melt-processible fluoropolymers** such as fluorinated thermoplastics or fluoroelastomers (page 2, line 1-6).

It is noted that PFOA, APFO or APFOA is reading on the claimed molecular weight of fluorinated emulsifier being less than 1000 g/mole. With respect to the limitation on "aqueous fluoropolymer dispersion having **a conductivity of at least 200 μS/cm**", such obtained polymers from Bladel would have enough polar endgroups such as COO^-, SO_3^- and $O\text{-}SO_3^-$ since ionic surfactants are used (page 5, line 4-7). The resultant dispersions made by Bladel would certainly carry the claimed conductivity since such endgroups are related to ionic type.

8. Regarding **Claim 2**, other ionic salt(s) may be used in addition to polar endgroups in the salt form mentioned above (page 9, line 17-28). All these salts would certainly contribute to a higher conductivity.

Regarding **Claim 3**, **non-ionic emulsifiers** are added before removing fluorinated emulsifier on exchange resin (abstract, line 1; page 9, line 30 – page 10, line 5).

Regarding **Claim 6**, fluorinated emulsifiers can be removed down to **less than 5 ppm in the extreme case** depending volume% of exchange resin and contact time (see table 1 in page 11; page 4, line 12-21).

Regarding **Claim 7**, the fluoropolymer dispersion will contain fluoropolymer up to **70-weight % after up-concentration** (page 1, line 17; page 7, line 1-16).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hintzer et al. (WO 01/79332) or Bladel et al. (WO 00/35971), each individually in view of McCarthy et al. (US 5,955,556).

Regarding the limitation of dependent **Claims 4 and 5,** both are dependent from parent Claim 1. The discussion of the disclosure of the prior art of Hintzer and Bladel for Claims 1-3 and 6-7 of this office action is incorporated here by reference. In a close examination, each of Hintzer and Bladel is **silent about specifically water-soluble salt (inorganic salt or a tetralalkyl ammonium salt)**. **McCarthy** et al. disclose that suitable cationic surfactants such as the **salts of fluorinated alkyl quaternary ammonium iodides** can be included (column 8, line 17-18). The advantage is such addition of conventional water-soluble surfactants in the preparation of dispersions will effectively improve the stability of aqueous dispersion (column 8, line 5 – column 9, line 20).

In light of the fact that **polymeric dispersions produced by Hintzer, Bladel and McCarthy, are containing the same type of fluoropolymers, which are obtained through aqueous emulsion polymerization**. Therefore, one having ordinary skill in the art would have found it obvious to add commercially available conventional surfactants **in the form of water-soluble salt** in the course of polymerization or post polymerization, specifically non-ionic surfactant and cationic surfactant, as taught by McCarthy with an advantage to obtain more stabilized aqueous fluoropolymer dispersions in an effective way.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to aqueous fluoropolymer dispersion with low or no fluorinated surfactant:

US Patent No. 4,623,487 to Cope discloses that a process for recovery of fluorosurfactants from an aqueous medium (abstract, line 1-9). Although it is a high-yield recover and the surfactant can be reused (column 1, line 12-17). **Cope does not disclose the recovery can obtain dispersion having fluorosurfactants less than 100 ppm**. Additionally, no claimed solid amount or conductivity is disclosed.

12. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Dr. Henry S. Hu whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

July 25, 2005

FRED TESKIN
PRIMARY EXAMINER
1713